DOCUMENT RESUME

ED 152 917 UD 018 106

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TITLE Principles of Success in Programs for Minority Students.
INSTITUTION Stevens Inst. of Tech., Hoboken, N.J.
PUB DATE [78]
NOTE 12p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *College Students; *Compensatory Education Programs; *Engineering Education; *Enrollment Influences; Higher Education; *Minority Groups; Program Content; *School Holding Power; Secondary Education; Success Factors
IDENTIFIERS *Stevens Technical Enrichment Program

ABSTRACT

Many special programs for minorities have had problems in retaining students. These problems can be addressed in a comprehensive program on campus. This approach characterizes the Stevens Technical Enrichment Program (STEP) at the Stevens Institute of Technology. Minority enrollment there has increased from 3 in 1973 to 86 in 1978. These students, many from inner city high schools, have progressed because of the college support programs and their own high motivation. The successes of STEP yield principles and recommendations of value for other institutions. The suggestions that are made to increase retention include: the fostering of a good academic support program, dissemination of information and communications, establishing positive relations with high schools, encouraging institutional support and developing alternative and private funding sources providing sensitive counseling, motivating students, fostering good community and parent relations, and providing staff training. (Author/AM)

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PRINCIPLES OF SUCCESS IN PROGRAMS FOR MINORITY STUDENTS

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Retention of minority and disadvantaged students has proved to be a difficult task at many engineering schools. Few educators would argue that disadvantaged students can perform well when academic support services are provided. However, without tutoring, counseling, financial aid and a good organization, disadvantaged students would fail miserably.[1] It is unfair to expect that students from educationally and economically disadvantaged backgrounds can compete with other students who have been prepared properly unless compensatory support is provided. It is proper to begin preparing disadvantaged youth by reaching into the elementary grades and continuing to give support throughout the completion of a given program. This approach characterizes the Stevens Technical Enrichment Program (STEP) at the Stevens Institute of Technology.[2] It has mushroomed into a sophisticated effort at both the pre-college and undergraduate levels. Its success yields principles and recommendations of value for other institutions.[3]

One, a minority program in a given field should help students who would otherwise not pursue study in that field. In the STEP pre-engineering program, a majority of the students reported that the program had improved their chances for success

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in high school and college. Scores on test and re-test of the Junior Engineering Tests, the California Achievement Test, the Sequential Test for Educational Progress, the Kuder Vocational Interest Test, and in-house tests show improvement among students. At the undergraduate level, most freshmen are accepted contingent upon their performance in a special six week bridge program of rigorous pre-freshman and freshman courses. All but a few of these students show enough improvement to be admitted as regular students in the fall.

Two, it is important that the students understand how the program works and carry some sense of responsibility for the program. The students must be willing to respond to questionnaires, to undergo tutoring, to try their best and, above all, to feel special without feeling inferior. If students do not report failures before they become catastrophic, no amount of staff support will save them from the inevitable. They must develop regular and honest study habits.

Three, retention is a vital factor. Recruiting qualified students is a relatively simple task. Once a network of schools is contacted and students become familiar with the Institute, good students will flock to the program. Unless efforts are maintained to help students to adjust to the new environment, develop sound study habits, and become familiar with the campus, large numbers of students will fail to complete the program.[4] In STEP 65% of the Class of 1978 and 75% of the Class of 1979 are still in school. This is remarkable since some of the

students have lower SAT scores than regularly admitted students.[5]

Among the reasons for attrition are lack of study, unfamiliarity with responsibilities, lack of ability, lack of interest and motivation, non-academic factors, personal problems, financial problems, and family problems. The most difficult of these to confront is lack of interest and motivation. High school students hear lectures by college students and admissions officers, make field trips to the campus, and undergo a pre-engineering program. In addition, STEP administers a comprehensive diagnostic test to freshmen candidates. It is used to predict academic success. Other predictors include personal and academic counselor guidance upon enrollment.

For success, students need a sense of commitment, a positive self concept, and a high level of maturity. STEP uses a variety of in-house and standardized evaluative instruments to augment interviews, observations and recommendations. The Wren Study Habits Inventory and the Mooney Problem Check List are used in the senior year of the pre-engineering program. Other instruments such as Super's Work Values Inventory, the Vocational Preference Inventory, and the California Psychological Inventory measure the ability to handle adjustment, independence, assertiveness, confidence, and over-all maturity. The Kuder Vocational Interest Test surveys the kinds of occupations best suited for the individual. It measures current vocation interest and with academic criteria, it helps students to make decisions about vocational interests.

Four, an atmosphere of trust and safety is necessary for students isolated from their familiar urban environment. STEP accomplishes this by encouraging a family feeling with students and staff on an informal first-name basis. It is not uncommon for small groups of students and staff to attend concerts, visit homes, or enjoy recreation together. An open door policy enables students to count on staff in troubled times and to share problems freely. Students who are having financial or personal problems or who "just want to rap" can stop by between classes. Informal personal contact is not only essential in order to avert potentially serious problems but it gives the staff a means of on-going acquaintance.

A non-threatening atmosphere helps to relieve some pressure competitiveness. The writer teaches a course entitled "Education of the Self". It aims to help students explore personal growth and adjust to the college environment. All incoming freshmen are required to enroll in the summer. Typical comments about the course are: "We realized that everyone cares about everyone else". "We had a chance to help each other". "We discovered that we all have similar problems". The course utilizes strategies from the human potential movement and insights into self knowledge based on research conducted at the University of Massachusetts.[6] A buddy system also helps students adjust to campus life. The old timers help new comers through the "hidden curriculum" - the unwritten strategies on study methods, professor preferences, and tension relief.

Five, good relations with parents is essential. In their concerns about their child's progress, parents can help with problems, temperament, and poor study habits.Through involvement in such mechanisms as parent associations minority parents can better understand the experiences and needs of their children. A parent association can help to familiarize parents with the college environment. Invitations to the campus, visits with teachers and staff and regular progress reports are invaluable.

Six, good relations with the community are essential. Minority and disadvantaged students must be made aware of the services and opportunities available to them. STEP works with community agencies such as anti-poverty programs, the National Association for the Advancement of Colored People, the Urban League, and ASPIRA. Community groups advise STEP on technical matters. In its drafting of grant proposals for federal funds, the STEP staff consults regularly with community representatives.

Seven, minority programs cannot survive without institutional support. Politically, fiscally, and morally, administrators must demonstrate an unyielding commitment to the program, or faculty, students and staff will lose confidence. At Stevens, the administration, from the president to the dean, is committed to the program. The president holds meetings to discuss STEP and makes supportive policy statements; the development office actively solicits funds. The provost and the dean of graduate studies and continuing education encourage faculty and others participate in STEP.

Eight, faculty relations must be favorable. In working directly with disadvantaged students, faculty are especially able to be sensitive to the needs of special students. When they become familiar with the programs' goals, they respect the students, interact with them, and become more willing to cooperate with STEP, a Faculty Advisory Board suggest ways to increase faculty participation, reduce conflict between students and faculty, and help students get the most out of courses.

Nine, the dean of students office helps with adjustment problems. This office facilitates student participation in campus activities such as clubs, fraternities, and student government. In this way, minority students add significant minority views on policy. An illustration of a dean of students office event is an "International Day" where students show pride in their respective ethnic backgrounds and respect for the backgrounds of other activities including, exhibits, dancing, foods and history.

Ten, counseling is essential for recruitment and retention. STEP employs a full-time undergraduate counselor and a part-time pre-engineering counselor. Both counselors agree that many of the reasons that students leave school are non-academic, having little to do with ability. A lack of adequate financial aid, a negative home environment, or negative neighborhood pressure can discourage students. One student, after two complete years, dropped out because he could not cope with the social pressure

and isolation caused by competitiveness and an unfamiliar social environment. The counselor encourages students to weigh all of the options carefully.

A democratic counseling approach fosters maturity, perseverance, and self esteem as incredients necessary above and beyond the ability to succeed at an engineering school. The counseling office gain the confidence of students by building rapport and maintaining confidentiality. It works with other members of the program staff, including-the director. It avoids proseletyzing or merely "giving advice". The counseling office keeps accurate and confidential records on each student, for it conducts a follow-up on students who graduate or transfer. A follow-up questionnaire requests data on program evaluation and on future employment and study plans. The data are added to other records such as grade point average of standard test scores, rank in class, and counseling.

Eleven, effective outreach yields information about science and engineering careers and identifies interested students. One method for effective outreach program is the employment of high school teachers. More than half of the sixteen pre-engineering teachers in STEP come from area high schools. The Pre-Engineering Laboratory for Teachers[7] and Accelerated Mathematics Project[8] employ other high school teachers. Another method is to work with the guidance counselors offering in-service workshops as needed, to recruit pre-engineering and undergraduate students. Regular contact with superintendents, curriculum specialists, and principals is also helpful, adding also to the

understanding of educational policy through its Equal Opportunity Fund Program. Other grant proposals are submitted to state and federal agencies to support various educational components of the program. Thirty-five percent of the funds come from corporate and foundation sources.

Twelve, a good staff training and rapport are most important. The staff must be well trained in managerial and teaching skills. Presently, STEP employs Management By Objectives (MBO), a total system employing philosophy and skills with specific results and goals. It helps STEP to garner and optimize resources, plan short-range and long-range activities, set priorities, and maximize staff participation. For example, STEP has completed many of the goals set last year, such as creating linkages with high schools, conducting research on high school and undergraduate students, and developing an on-going academic support program. In short, goals are established and budgetary allocations are made to complete those goals. All staff assignments, activities, projects, and objectives are reported in cost-effective terms.

Thirteen, programs must develop good liaison with the career planning and placement office. Minority students must be encouraged to use these offices fully in order to be aware of the alternatives available, to gain valuable interview experience, to research potential employers, and to improve decision making.

Fourteen, a comprehensive research component must be established to document the strengths and weaknesses of the program. STEP employs a research assistant to compile data on the program,

working with the Department of Management Science and the Center for Psychological Studies. The Sequential Test for Educational Progress test covers mathematical computation, basic mathematics, science, English expression, reading and the mechanics of writing. Although norms have been established for this test using over 10,000 high school students representing all socio-economic levels, STEP chose further validation for the purpose of predicting academic success by correlations with other criteria such as high school grades, the JETS test, the California Achievement Test and grades.

Fifteen, good relations with funding agencies must be cultivated. Foundation and corporate sources may conceivably fund in full a minority engineering program but government and other sources are also strong. STEP receives 40% of its operating funds from the Department of Health, Education and Welfare and 25% from the New Jersey Department of Higher Education. Private contributions to STEP have increased 40% over the year, primarily due to increased interest in the program and aggressive solicitations. Private funding is an integral part of the STEP program because of the restrictions placed on student participation by the Department of Health, Education and Welfare and the New Jersey State Equal Opportunity Fund would exclude many talented pre-engineering and undergraduate students.

Sixteen, good relations must be maintained with the development office to coordinate fund-raising activities. At Stevens, the development office and the STEP office work closely

to seek corporate and foundation funds. Long standing donors are maintained by the person who has previously "brought in the funds". The President and/or one of his assistants and the STEP director make some of the direct visits to corporations and individuals.

In summary, organizing successful programs for disadvantaged minorities requires a combination of traditional and non-traditional approaches. Basic skills and affective learning are instrumental for a total educational experience. Dedicated teaching, expert management, public relations, and fund raising blend together to foster a special program for disadvantaged students.

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